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### Burning mouth syndrome: Cross-sectional study

**Rathi Rela and Girish R Dongarwar**

#### Abstract

**Introduction:** Burning mouth syndrome (BMS) can be defined as burning pain or dysesthesia on the tongue and/or other sites of the oral mucosa without a causative identifiable lesion. The discomfort is usually of daily recurrence, with a higher incidence among people aged 50 to 60 years, affecting mostly the female sex and diminishing their quality of life.

**Materials and Methods:** 40 medical records of patients diagnosed of burning mouth syndrome and 40 medical records for the control group were studied retrospectively. The study time span was from March 2012 to December 2013.

**Results:** Menopause, candidiasis, psychological disorders, job status, denture, and dry mouth were significantly frequent in BMS patients. Ultimately, age was defined as a critical predictor. Moreover, we can therefore predict that age is a major determining factor in occurrence of BMS.

**Conclusion:** As a multifactorial disorder, the treatment of BMS should be executed in a holistic way.

**Keywords:** Burning mouth syndrome, pain, syndrome, mouth disease, risk factors

#### Introduction

Burning mouth syndrome characterized by constant burning sensation in oral mucosa with dentist or physician finding no convincing physical explanation to it [1]. Such conditions can occur in several local, systemic diseases or psychiatric conditions that must be ruled out prior to making a diagnosis of burning mouth syndrome, since this term is used exclusively to refer to idiopathic forms and is included within different sensory disorders [2]. Burning mouth sensation is probably of multi-factorial origin and can be a symptom of another disease when local or systemic factors are found to be implicated; however the exact underlying etiology remains uncertain [3]. Glossodynia', glossopyrosis' and oral dysesthesia' are synonyms for the term burning mouth syndrome' found in the literature. In recent years, the prevalence of BMS increased and it has become a common chronic or official pain disorder. The reported prevalence in general population varies from 0.7% to 15% [4]. The causes of BMS remain open to controversy. The vast majority of affected persons are older than 50 years and there is a preponderance of women (male-to-female ratio between 1 and 4) that were postmenopausal or had experienced sex hormonal change [5]. Most patients experience burning sensations of moderate-to-severe intensity with mean severity of about 4.6–8 cm on a 0–10 cm visual analog scale [6]. The tongue is the most common site of the complaint, though it may be accompanied by other parts of the mouth [7]. Physiological and psychological factors play a role in causing and/or exacerbating BMS with continuum, but the interaction between these remains poorly understood [8]. Anxiety and depression were the common features in BMS patients [9]. Other characteristics of BMS included cancer phobia, gastrointestinal problems, and chronic fatigue [10]. This is the first study performed to access age or sex as factor associated with BMS. The aim of this study was to explore different etiologic factors contributing to BMS and to estimate the magnitude of their value by considering age and sex in a comparative cross-sectional study.

**Materials and Methods:** The aims of this study was to determine the role of age and sex in BMS. A hospital based cross sectional study was conducted among patients reporting to department of Oral Medicine and Radiology with complain burning mouth. The study recruited 80 participants. Total 80 patients, 40 with symptoms of burning mouth syndrome and 40 without any symptoms of burning mouth.

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**Study Design:** Hospital based cross sectional study.

**Study settings:** Dept. of ODMR

**Study Subjects:** Among total of 80 patients enrolled in my study the age group ranged from 30-60 years. Among the study group which comprised of 40 patients, 25 was females and 15 were men and among control group the ratio was kept same.

**Inclusion Criteria:** Patients with BMS who had experienced oral, burning sensations for at least 6 months without oral clinical signs, and with a normal blood count.

**Exclusion Criteria:** Patients with without burning sensation were recruited in this study

**Data Collection Tool:** Clinical examination was investigated followed by detailed demographic history was undertaken by interview and patients underwent a thorough clinical oral examination. Their medical history was recorded and verified by a physician. The possible underlying causes were investigated, and all patients underwent routine hematologic screening which included serum iron, total iron-binding capacity, Vitamin B12, hemo globin count, folic acid and fasting blood glucose.

**Statistical Analysis:** Statistical Data analysis was done using Epi Info.

**Methodology:** Forty patients presenting with BMS and 40 individual without this symptom participated in this prospective cross-sectional study. BMS patients had been consecutively referred to Oral Medicine March 2012 to December 2013. A total of 25 women (62.5%) and 15 men (37.5%) in the BMS group were recruited in this study by estimating sample size with power 90% and 95% confidence interval. None of the patients presented any evidence of malignancy, connective tissue, metabolic or infectious disorders, or vitamin deficiency. Patients with dentures were

assessed for fitness, function, and candidiasis. Swabs for *Candida* were taken before the diagnosis was made. Those with candidiasis were treated with antifungal therapy. As mentioned, it is postulated that gender and age have profound influences on BMS, hence a prospective, comparative, cross-sectional study was carried out to account for age and sex as predictors. The comparative group "without BMS" comprised 40 patients without any complaint of burning mouth who had sought dental treatment at the Department of Oral Medicine.

The characteristics of BMS patients and non-BMS controls were transferred to data sheets Epi Info analyzed statistically. Chi-squared test and *t*-test were used to evaluate differences in group characteristics.

## Results

**Table 1:** Profile of burning mouth syndrome patients and comparative group

	BMS patients (n=40)	Non-BMS patients (n=40)	Total
<b>Sex</b>			
Female	25	25	50
Male	15	15	30
<b>Age</b>			
<50	11 (28.20)	33 (84.21)	44
>50	29 (71.79)	7 (15.78)	36
<b>Job</b>			
Homemakers	26 (66.15)	12 (31.57)	38
Employee	14 (33.84)	18 (68.42)	32
<b>Residency</b>			
Urban	34 (87.6)	37 (93.68)	71
Rural	6 (12.30)	3 (6.31)	10

Table 1 illustrates the general profile of the study population. There was an unequal gender distribution in favour of females; 25 women (62.5%) and 15 men (37.5%) in the BMS group. There was a difference in distribution of patients according to age group; with preponderance in the age  $\geq 50$  years.

**Table 2:** Stepwise multiple logistic regression coefficient of odds ratio and confidence for variables

Variables	B	Standard error	Significance	Confidence interval	
Psychogenic factors	0.679	0.468	0.077	0.0766	8.27
Age	0.126	0.016	0.000	1.081	1.150
Constant	-3.68	0.663	0.000		

Table 2 shows that only age remains as a predictor in BMS. Psychological disorders show less strength odd in this step but are kept as predictors. By taking outcomes into consideration in hierarchical approach, age is the specific ultimate measure which is significantly associated with the onset of a disease, but after that psychogenic disorder may could be another risk factor which may increase the odds of BMS in Table 2, we can predict that the susceptibility (probability) of BMS in women may increase  $>3.38$  fold by rise in age. And we can predict that a 60-year-old woman with a psychological disorder is 8.9 times more likely to suffer from BMS than a 50-year-old woman without psychological disease. More than 70% of patients complained of burning sensation in their oral cavity with no distinct part (71.7%); tongue (12.8%); anterior part (46%), the lateral border of tongue (43%), and the center of the tongue (11%); lips and gingiva (2.5%).

## Discussion

This study pointed out the importance of risk factors in BMS. This study defines that age and sex are the critical risk factors and has a substantial correlation with the occurrence of BMS. Different studies implicitly acknowledge that patients in their later age after 40's are more prone to the burning sensation.<sup>11</sup> However, different methodological research applied could only mention that patients with BMS are of older age without determining and outweighing this important risk factor. In this study, results pointed out that age was a consistent predictor; the probability of BMS increases by passing decades of life. Gender difference was addressed in different studies<sup>12</sup> however, investigation into this issue was verified by outcomes; identifying that sex is the main risk factor to increase the odds of BMS. Women may be liable to physical and emotional changes including vasomotor changes (hot flushes, profuse perspiration, and palpitation), psychogenic

disorders (depression, tiredness, irritability,) and other complaints such as headaches <sup>[13]</sup>. Although recent research indicates that psychological factors play a role in causing or exacerbating BMS, this study provides support that strengthens the role and odds of psychogenic disorders. Different studies claim that patients with BMS suffered from psychological disorders <sup>[14]</sup>. Psychological disorders, especially depression and anxiety, are the most common features reported in different studies. Psychological disturbances and adverse life events can decrease the patient's tolerance, making them more susceptible to different chronic diseases <sup>[15]</sup>. On the other hand, this study apparently showed that age and sex are inevitably the underlying risk factors which are out of control. Eventually, reasons for failure in treatment need to be explained to patients before initiating treatment. Job status or in detail homemakers revealed a significant association within BMS and 66% of patients with BMS were unemployed. Implicitly, Grushka pointed out that a person's job may have an effect on BMS <sup>[13]</sup>. Unemployed females older in age with postmenopausal history with or without psychological disorders may feel insecure and this circumstance may rise the chance of BMS in them more than in fully employed women. Significant relationship between candidiasis and BMS has been defined in this study; 19% of BMS patients had been treated for candidiasis. Many studies stated that patients are often triggered by other predisposing factors such as wearing a denture or having xerostomia <sup>[14]</sup>. In this study, 24% of the patients with BMS used dentures though there were no ill-fitting dentures or other problems to cause candidiasis infection. Study has indicated that 30% of patients were treated for candidiasis in relation to BMS <sup>15</sup> but another study showed that there was no significant relation between candidiasis and BMS. Another possible risk factor for BMS is xerostomia. There was a significant relationship between xerostomia and BMS in this investigation; 27% of BMS patients suffered from xerostomia. Many studies in indicated that xerostomia was a principal contributing factor. Most patients perceived burning in the whole oral cavity or in more than one site. This is an interesting finding and may be attributed to the culture of the respondents or the type of question. Further studies need to assess pain by multiple conditions. The subsidiary sites of BMS were the tongue, especially the anterior part of the tongue. Different authors have shown that burning sensation can be reported in each location and in more than one site or in the whole mouth. They found that the tongue, especially its anterior part, the dorsum, and the anterior lateral margins are the most frequently affected areas <sup>[16]</sup>.

### Conclusion

In this comparative study, in the absence of local and systemic underlying factors, we conclude that age and sex are the main factors in the onset of BMS. Para functional habits like bruxism and abnormal movements of tongue and lips can explain the BMS main symptomatology. Psychological aspects and systemic factors should be always considered. Other predictors such as candidiasis, job status, denture, and xerostomia revealed association by different odds for the occurrence of BMS strength to cause BMS.

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